



**SAN BERNARDINO MICROWAVE SOCIETY, Incorporated**

FOUNDED IN 1955

A NON-PROFIT AMATEUR TECHNICAL ORGANIZATION DEDICATED  
TO THE ADVANCEMENT OF COMMUNICATIONS ABOVE 1000 MC.

## **SBMS (W6IFE) Newsletter For January 2014**

### **Activities of the San Bernardino Microwave Society**

#### **Tech Talk for the January 2<sup>nd</sup> Meeting**

#### **Development of the Modern Communications Receiver -- Part II**



In Part I we discussed the early days of receiver development. Part II provides a quick recap of the "Defining Moments" and goes on to show the impact of World War II, the development of the transistor and the "digital revolution."

# Important Points of the December Business Meeting

## Guests Or Members Not Seen In a Long Time

**Rich Balansky KG6UDD** (Fullerton Ham Radio Club and friend of many of the members of SBMS.)

**Barry Malowanchuk VE4MA** (Our speaker for the evening.)

**Greg Bailey K6QPV** (Member of our sister club: San Diego Microwave Group SDMG)

## Old Business

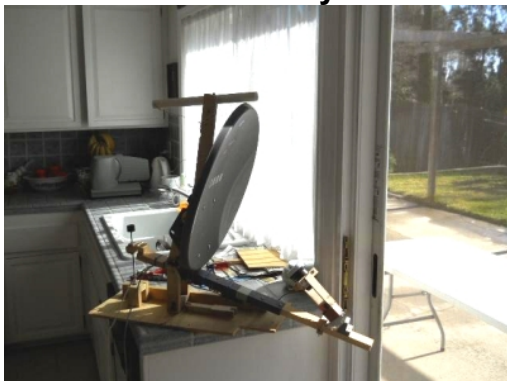
- Christmas Party date etc. finalized.
- Dennis Kidder W6DQ spoke on the OVRO EME project: It is official. It is no longer to be associated with the OVRO. Its location isn't finalized but Dennis offered his place in Inyokern. The equipment is being donated by Chuck (his 10 GHz test range facility). Dennis said the club will need to fund a storage container which would also serve as the dish base.

## New Business

- There was some discussion on club operations; there needs to be a permanent address associated with the club for tax and other purposes.
  - Dick Bremer found a store front mail box firm that would rent us a mail box with a for real address. The cost is about \$180 a year.
  - There was discussion on which is better; US Mail post box or the above store front mail box. (The secretary assumed the store front mail box was preferred.)
  - Motion passed that our official address is:  
The New Mail Address is:  
SAN BERNARDINO MICROWAVE SOCITY  
417 Associated Rd. #146  
Brea, Ca.92821
-

# What Our Members Are Working On

- **Dick Bremer WB6DNX**
- daughter is in town. This put the kibosh on all microwave activity.
- **Greg Bailey K6QPV**
- was visiting us from SDMG. He maintains their beacons.
- **Ed Munn W6OYJ**
- his 1296 rig is back on the balcony for local activity in the north and west direction.
- he and Kerry will be at Maker Faire.
- **Dennis Kidder W6DQ**
- he said that Bill Burns (also in the Inyokern Ridgecrest area) says hello.
- will be at Maker Faire with Walt and Wayne.
- is now a for-real (has contract and money) author for McGraw Hill "Arduino Projects for Ham Radio".
- **Rich Belansky KG6UDD**
- is A-D-D on HF ham radio and looking for a more challenging UHF microwave project
- **Tom Curley WB6UZZ**
- operated the Frequency Measuring Test with Rich Belansky, KG6UDD, (both in the Fullerton area)
- working on getting up a discone antenna for 25 MHz to 1 GHz.
- **Jeff Fort KN6VR**
- has been doing paper work for SBMS (This activity involves IRS, and other business forms. His effort here is very much appreciated by the other SBMS officers.)
- **Jason Sogolow W6IEE**
- inventory reduction. He's trying to make room for "new" surplus stuff.
- **Courtney Duncan W5BF**

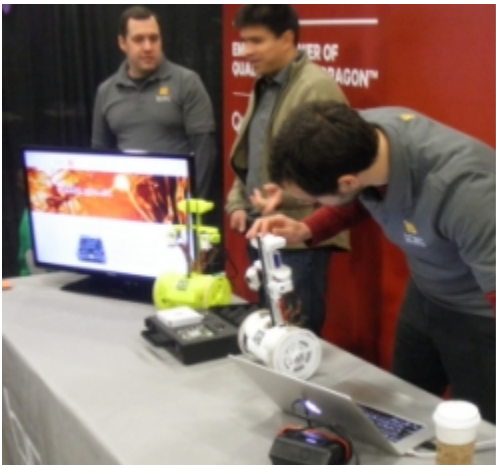


- Getting ready for the January HF 10 band contest he broke in a maintenance event.
- **Rein Smit W6SZ**
- worked with Doug on mechanical things related to Doug's dish
- was with Brian on Kolbly's radio
- made an interesting discovery on his kitchen table. It is a hot spot for the PV beacon; stronger than anywhere outside the house.
- on the Wednesday-Before home2home he saw the usual four 10 GHz beacons but had trouble with Tony
- will have an omni at 20' next month

- **Frank Kromann AG6QV**
- Received in the mail his replacement transistor and soldered it in his rig.
- Messed around with his 23 cm antenna and with it heard the San Diego beacon.
- No luck with the Wednesday-Before-From-Home
- Went to Doug's sidewalk EME event
- **Dan Welch W6DFW**
- Getting going on a run for the 10 GHz omnis
- **Mel Swanberg WA6JBD**
- Did some work on his 2.3 GHz repeater project
- There's 10 GHz noise into the synthesizer but works on the up and down
- **Jerry Mulchin N7EME**
- Brought in the preamp on his repeater project.
- He will be adding the preamp this month
- He also brought in his 25 watt 2.3 GHz PA
- Has yet to get the cesium oscillator and rubidium frequency standard working
- **Barry Malowanchuk VE4MA (Our speaker for the evening.)**
- He and his wife are in their winter home in Arizona this month.
- There he has a 5' offset dish with which he has worked 14 stations on 1296 MHz ( 12 on CW and 2 on WSJT) with excellent reports using 150 watts and 5 stations on 5.7 GHz EME.
- His present project is 902 MHz EME with the 5 ft dish and 300+ watts
- He also has a 125 watt 3.4 GHz rig to try out this winter on EME
- His other AZ projects include completion of some additional 175 watt 1296 MHz PAs
- He is active on 144, 432, 902, 1296, 2304 and 10 GHz terrestrially from Apache Junction AZ DM43fk with modest antennas.
- He is on the committee to select hosting clubs for MUD and wanted to get our formal commitment for doing so in 2015.
- **Doug Millar K6JEY**
- Did another Sidewalk EME at his house in Long Beach. Bob, Frank, John, Stan and about a dozen others dropped by to watch the activities.
- Learned that leaving the dish in the garage is not a good idea
- He's tired of fighting noise on 2 meter EME
- He said monitoring something or other using Rein's LNB-dongle-SDR setup was very useful.
- 300 watts on 1296
- **Chris Shoaff N9RIN**
- took this time to remind us that \$15 a month is only \$1.25 a month and we are all to hand that money in at the April meeting.

# Maker Faire

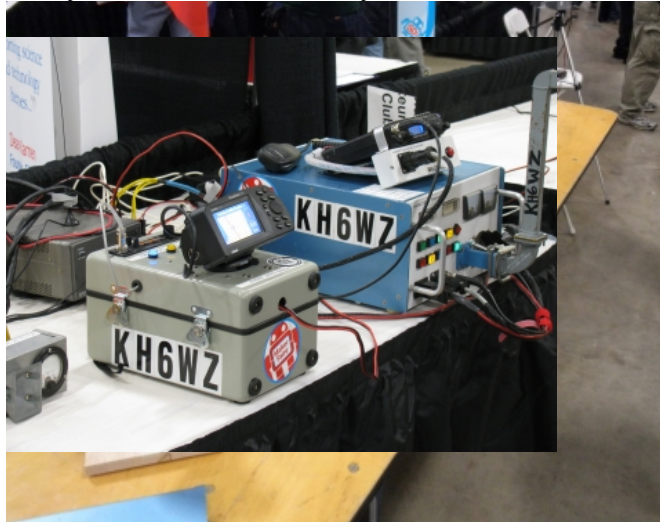
It was a gathering of young minded non-professional engineers and scientists. As Dennis reminded his audience many times; hams were the original amateur scientists. Since then of course the description has changed: re-purposing (as in Calcomm boards to 10 Gig rigs, I guess) and “make community” done in places called “hacker spaces.” What follows is a taste of what was there. . .





## Maker Faire Cont.

Walter, Dennis and Wayne drove down to Del Mar. For Kerry and Ed, it was almost in their backyard. Here's Walt's very hands-on exhibit "Visualizing Radio Waves" . . .



And Wayne Yoshida's Rig . . .

Here's an excellent slide show of that faire by Wayne: <http://wayneyoshida-kh6wz.com/2013/12/08/not-your-grandpas-ham-radio-at-the-2013-san-diego-mini-maker-faire/>

Kerry Banke brought the smallest exhibit but it was way over the heads of most people there.



Here's how Kerry describes it:

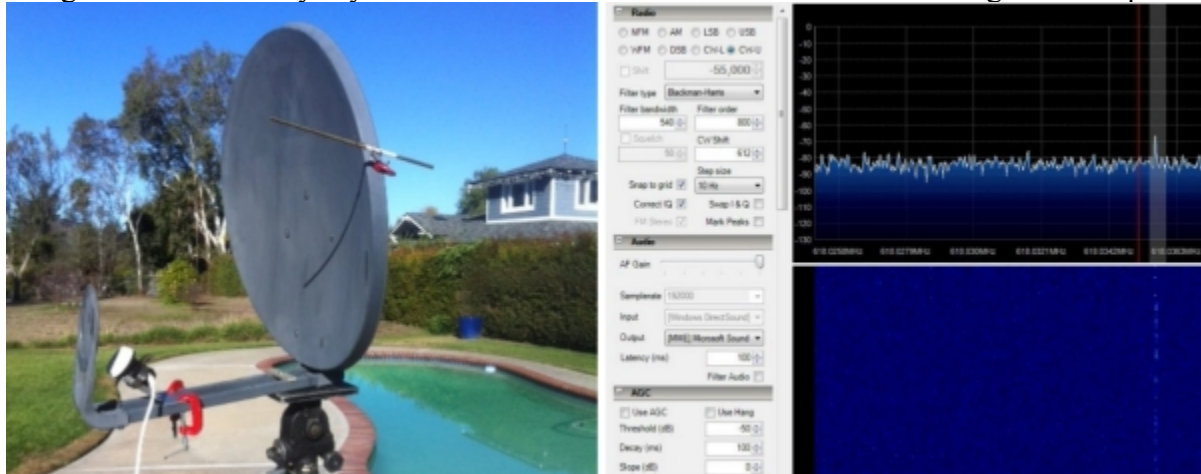
"The microwave diode across the end of a coax connected to 10 to 100 mw of 432 MHz FM from a handi-talkie was standard procedure for a marker for use with Gunnplexers. Very low power and of course puts out harmonics all the way up to X-band. The best for 10G of course is a diode mounted in waveguide to suppress lower harmonics and create an open waveguide antenna with some gain."

Kerry said that it is omni for about a hundred feet. The receiver would be any 10 GHz rig with typical microwave ham receiver noise figures. Transmit only of course but he also brought a super simple receiver that is extremely sensitive. It is the LNB-DTVdongle-SDR that our own Rein Smit is expert on.

The diode Kerry used on his umpteenth harmonic 10 GHz upconverter was salvaged from Qualcomm boards but he said the commercial microwave diodes available at Down East or even eBay should work.

### More on Kerry's LNB-DTVdongle-SDR

Here's what Kerry has mounted the poor man's receiver on. Notice the sub-reflector and his siting device. See Kerry if you would like to know more about this interesting reflector pair.



The screen shot on the right is of the DL0SHF 10 GHz moon beacon. Yes; from the moon! The software that turns the dongle into an SDR is available at: <http://sdrsharp.com/> The nice thing about the recording feature of SDR Sharp is that it captures the IQ data so that when replayed you can tune the spectrum and make any adjustments needed for analysis. In my case I replayed it a number of times and changed the CW filter characteristics to give me the best results. It took a number of tries to copy the call sign as various parts of the call sign were clearer during different transmissions. The LO of the LNB is 9750 MHz so  $9750 + 618 = 10368$ . The display showed about (618.035) 10368.035 but the DVB-T dongle and LNB both may have drifted some KHz after I calibrated the system.

BTW - We are starting discussions on putting a SDMG 10 GHz repeater back on the air.  
- Kerry N6IZW

And here's more on the use of the moon as a 10GHz beacon: <http://www.rtl-sdr.com/receiving-10-ghz-reflected-moon-beacon-rtl-sdr/>

---

This next article uses the same cheap but sensitive receiver assemblage; what Rein likes to call the ***Dongle Based 10 GHz SDR***

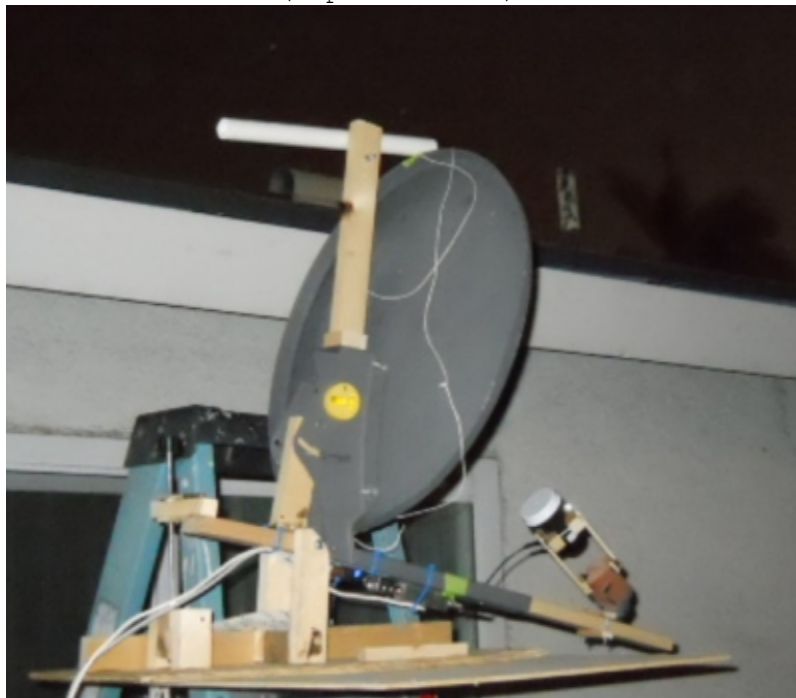
## **Detecting the German 10 GHz Moon Beacon (Rein Smit W6SZ)**

Most of you probably know about the 10 GHz beacon being operated by the DL0SHF group for some time (10.368.025 MHz). DL0SHF transmits a signal to the moon when the moon is visible at their site in Germany. They run 2 modes: 50 and 500 W output, 20 seconds on, 40 seconds off. (So just because we can see the moon, doesn't mean we can hear them.)

I managed to detect the beacon with a very simple receiving package describe elsewhere in this newsletter. I'm using WSJT moon tracking data, the signal appeared right away when the moon appeared above the trees.

The signal lasts only 20 seconds but then 40 seconds later, it returned! By the books. I use a simple 10 GHz rig that I use for scouting signals on 10 GHz terrestrial as member of the San Bernardino Microwave Society.

At times I measured the beacon as high as 15 dB above the noise using HSDR as DSP software. Here are some pictures:  
<http://www.nitehawk.com/w6sz/moon2.jpg>, signal visible in filter window as a smear, and in wide band window at about 618.010 MHz as a short line lasting about 20 seconds (top waterfall)



Thank you DK7IJ and the DL0SHF Group.

W6SZ





Here's Brian Thorson—the well equipped for winter Brian Thorson—mounting some sort of J antenna on a really effective ground plane.

**And below, Christmas party at Dennis Kidder's**



**Noise measurements of a Dongle Based 10 GHz Receiver  
by Rein Smit W6SZ**

With the weather as nice as it was, I decided to make some noise measurement with my **Dongle based 10 GHz receiver**. The rig consists of a PLL-LNB available on eBay for less than \$10 and a DTV dongle (also from eBay for less than \$10). The software that makes it a software defined radio is RTL-SDR available for free <http://www.rtl-sdr.com/> The setup was assembled to make field measurement easy on 10 GHz. The dish can be placed on the roof of a car and one can obtain reception without much to do. The receiver uses an 18" regular TV satellite dish with manual elevation/azimuth control as well as basic polarization adjustment.

The output of the dongle is normally processed with a laptop running HSDR for waterfall and graphic display. The other computer's software provides all the usual modes such as CW and SSB. For digital modes such as PSK, JTxx and WSPR an additional computer is required as the used laptop is not able to run 2 digital programs simultaneously.

For noise measurement the computers involved are a desktop running HSDR and a laptop running SpectraVue. The purpose is not communications but measuring the noise levels; actually comparing noise levels. This setup has been used for researching propagation between K6HLH (Larry Johnston) in DM14cp and W6SZ (Rein) in DM14ed via bouncing 10 GHz signals off Keller Peak in DM14ie (8000 ft plus). Recently moon bounced signals from D10SHF (Germany) were detected with this same setup (see Ref 1)

For the noise measurement the output of the HSDR (on the desktop computer) was sent to the laptop running SpectraVue. This showed noise levels on a logarithmic scale in dB. The measuring chain was checked for possible saturation problems. Sun noise was measured with the Sun in the south at around 21:00 UTC while cold sky was measured from a sky area (away from the sun) at 135 degrees Azimuth and 45 degrees Elevation. Here are a number of pictures indicating the SpectraVue results:

[http://www.nitehawk.com/w6sz/noise/cold\\_sky\\_gr\\_noise\\_w6sz\\_PLL\\_LNB\\_dongle.jpg](http://www.nitehawk.com/w6sz/noise/cold_sky_gr_noise_w6sz_PLL_LNB_dongle.jpg)  
(cold sky -> ground noise levels)

[http://www.nitehawk.com/w6sz/noise/scout\\_sunnoise2.jpg](http://www.nitehawk.com/w6sz/noise/scout_sunnoise2.jpg)  
(cold sky - sun noise)

[http://www.nitehawk.com/w6sz/noise/scout\\_sunnoise4.jpg](http://www.nitehawk.com/w6sz/noise/scout_sunnoise4.jpg)  
(cold sky -> sun noise)

Note: values on dB axis are all relative.

(Ref 1) <http://www.nitehawk.com/w6sz/moon2.jpg>  
[http://www.nitehawk.com/w6sz/10ghz-beac\\_5.jpg](http://www.nitehawk.com/w6sz/10ghz-beac_5.jpg)

Rein Smit W6SZ

## **Members and Guests Watching on line by way of Gary Heston's ATV Mobile Studio**

Lots of ATV viewers this month. Here are the call signs of those who were in the BATC Chat room commenting to each other during the SBMS meeting on 12/5/2013.

AF6NA

K4QF

KA6FEW

KC6JPG

KD6NIZ

KE6BXT

Don Hill, KE6BXT

## **Home2Home 10 GHz QSO party (The Night-Before-The Meeting)**

**Next One: Wednesday Jan 1 21:00 PST 10368.1 MHz**

December activity Report Home2Home QSO party:  
There were only 2 participants:

KC6QHP

W6SZ

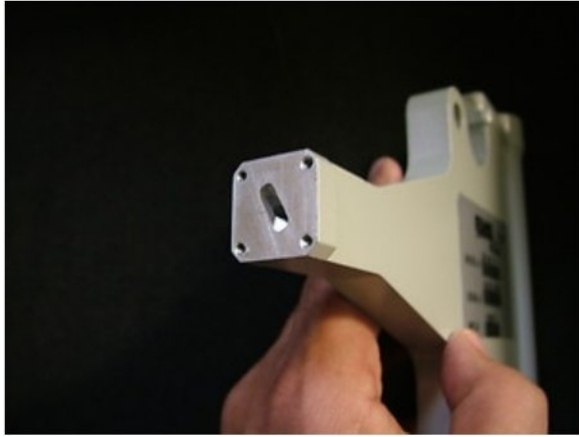
## **Upcoming SBMS Meeting Tech Talks**

- **Feb.** Marty Woll: Contesting techniques.

For information on other events... see “Activities” in the SBMS website, which, you should have memorized by now

- Google then SBMS
- click on our website
- then Ctrl-F Activities

## Microwave Mystery Device of the Month



### Needs, Wants and For Sale

**For Sale:** 30w 1296 MHz PA kit \$50 + \$5 for US shipping Chris Shoaff, N9RIN  
cshoaff@yahoo.com

**For Sale:** 10 GHz slotted waveguide antennas \$55 kit, \$80 assembled plus  
shipping Dan W6DFW [W6DFW@apex-scientific.com](mailto:W6DFW@apex-scientific.com)

**Need-** HP 8694 8-12 GHz sweeper plug-in for 8690 main frame Chuck WA6EXV  
760-382-0709

### For Sale from Bill Burns

Bill will only rarely come to the meetings, so if you want any of this, please  
contact him by email at . . . [bburns@mediacombb.net](mailto:bburns@mediacombb.net)

- 8 watt 5 GHz TWTs with power supply \$50 each
- 50 ft extension cord 3/#14 wire free.
- HP 410B multimeter with RF probe and manual free.
- Copper wire enamel coated #14 many feet coils \$10 each.
- Bencher BY-1 Iambic paddle key new in box was \$135 now \$90
- 1 reel of 3 twisted #12 copper coated steel cable about 500 feet free
- 7 inch Reflecting telescope with tripod was \$100 now \$80

---

## Commercial Ads (from our members)

### Kits Made by member KL7UW (Sixty North Electronics)

Let Ed Cole assemble your Down East Microwave kit. For kits in stock, he can  
deliver an assembled unit to your custom design preferences within 30-days of a  
paid order. [His prices are the same as you pay DEMI for an assembled](#)

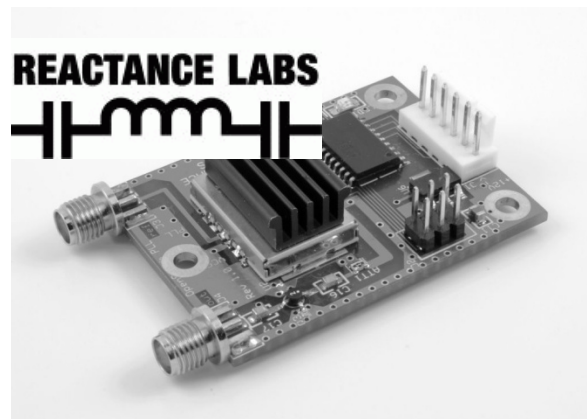


transverter, but much quicker delivery time. And comes with 90-day written warrantee on labor (guaranteed to work)!

Shipping for a transverter is typically that of medium-size flat-rate Priority Mail anywhere in the USA.

Contact him at [kl7uw@acsalaska.net](mailto:kl7uw@acsalaska.net)

See examples of his work at <http://www.kl7uw.com/kits.htm>



Introducing the **OpenSynth** line of frequency synthesizer kits. Available in standard frequencies of 2556, 2952, 2160, 1152, 3312, 3006 MHz, also available from 400 MHz to 3500 MHz.

- Low phase noise, Buffered output
- Ultra low noise voltage regulators
- Open Source code and design, made to be modified
- 2" x 1.5", 12V @ 140 mA typical

Available at <http://reactancelabs.com>

## SBMS Communications “Between” Members and “To” the World

**SBMS Reflector** is a group e-mail. It is the most active method of information exchange of local microwave activity and advice. You don't need to be an SBMS member to participate. (The contents of the SBMS group email letters are of course, ephemeral in that there's no record kept.) To subscribe as a reader and

to be able to submit letters to the group, fill out the form at this website:  
<http://lists.altadena.net/mailman/listinfo/sbms>

The **SBMS Newsletter** is a one-way communications (to as wide an audience as possible) about Southern California microwave ham activities. A link to it is sent to members and past issues are recorded in the website. The newsletter is created about the middle of the month and broadcast as a link inside an eMail letter to the members. This is mailed to you on the weekend prior to each meeting. SBMS Newsletter and website material can be copied as long as SBMS is identified as source.

The website URL is: <http://www.ham-radio.com/sbms/> You don't have to memorize that or write it down, just enter **SBMS** into any internet search engine.

### **For more information on our outreach activities contact:**

- **Newsletter Editor:** Walter Clark: [walterClark@roadrunner.com](mailto:walterClark@roadrunner.com)
  - **its distribution and archival:** Rein Smit: [rein0zn@ix.netcom.com](mailto:rein0zn@ix.netcom.com)
- **Website Maintenance:** Rein Smit: [rein0zn@ix.netcom.com](mailto:rein0zn@ix.netcom.com)
- **SBMS Reflector (group email):** Dave Glawson: [wa6cgr@ham-radio.com](mailto:wa6cgr@ham-radio.com)

# Officers and Key Members of the San Bernardino Microwave Society (SBMS)

## **President Chris Shoaff, N9RIN**

2911 Calle Heraldo San Clemente CA 92673 phone: 949-388-3121

email: [cshoaff@yahoo.com](mailto:cshoaff@yahoo.com)

## **Vice President: Chuck Swedblom, WA6EXV**

PO BOX 605 Ridgecrest, CA 93555 phone:

email: [chuckswed@juno.com](mailto:chuckswed@juno.com)

## **Recording Sec Walter Clark**

824 Valley View Fullerton CA 92835 phone: 714-882-9647

email: [walterclark@roadrunner.com](mailto:walterclark@roadrunner.com)

## **Corresponding Sec Jeff Fort, KN6VR**

10245 White Road Phelan CA 92371 phone: 909-994-2232

email: [jnjfort@Verizon.net](mailto:jnjfort@Verizon.net)

## **Treasurer Dick Bremer, WB6DNX**

1664 Holly St. Brea CA 92821-5948 phone: 714-529-2800

email: [rabremer@sbcglobal.net](mailto:rabremer@sbcglobal.net)

## **Newsletter Editor Walter Clark**

824 Valley View Fullerton CA 92835 phone: 714-882-9647

email: [walterclark@roadrunner.com](mailto:walterclark@roadrunner.com)

## **ARRL Interface Frank Kelly, WB6CWN**

PO Box 1246, Thousand Oaks, CA 91358 phone: 805 558-6199 <mailto:wb6cwn@gmail.com>

## **W6IFE License Trustee Ed Munn, W6OYJ (call sign for club beacons)**

6255 Radcliffe Dr. San Diego, CA 92122 phone: 858-453-4563

email: [remunn@earthlink.net](mailto:remunn@earthlink.net)

## **Lab manager Dave Glawson, WA6CGR**

1644 N. Wilmington Blvd Wilmington, CA 90744 310-977-0916

email: [wa6cgr@ham-radio.com](mailto:wa6cgr@ham-radio.com)

## **SBMS Website Editor Rein Smit W6SZ**

8333 Pumalo Alta Loma, CA 91701

email: [rein0zn@ix.netcom.com](mailto:rein0zn@ix.netcom.com)

## **Webmaster Dave Glawson, WA6CGR**

1644 N. Wilmington Blvd Wilmington, CA 90744 310-977-0916

email: [wa6cgr@ham-radio.com](mailto:wa6cgr@ham-radio.com)

## About SBMS

The San Bernardino Microwave Society is a technical amateur radio club affiliated with the ARRL having a membership of over 30 amateurs. The focus of the club is microwave activities in the Southern California. ***Our sister club is San Diego Microwave Group (SDMG). At least one meeting a year are joint meetings.*** SBMS dues are \$15 per year, which includes a badge and that's about it. The dues are more in the way of a donation to pay for outreach things such as video portals, a bank account, and rent for the building, insurance, stamps etc. ***When*** to pay is now the April meeting and you will be reminded ruthlessly. These annual dues can be handed to the treasurer at the meeting, or mailed to the address of the treasurer listed in the officers list above. Meetings are first Thursday of the month, 7:00 PM at the American Legion Hall, Corona. Join us for dinner starting at 4:30 at Sizzler just off the 15 in Corona. For carpooling from North Orange County contact Walter Clark in the officers list above.